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Kevin R. Cini
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David H. Meyer
Acting Deputy Director
Office of Electricity Delivery and Energy Reliability
U.S. Department of Energy

Mr. Meyer:

Southern California Edison (SCE) would like to thank the Department of Energy (DOE) for the opportunity to provide our input on the matter of economic dispatch. As a load serving entity under the jurisdiction of the California Public Utilities Commission (CPUC), SCE is obligated to serve its customers through "least cost dispatch". In addition, SCE is a participant in the California Independent System Operator (CAISO) and thus is subject to the transmission access and dispatch protocols defined in the CAISO Tariff. It is our understanding that the Energy Policy Act's (Act's) definition of "economic dispatch" is consistent with a "least cost dispatch" – that is operating a combination of "total resources" (i.e. generation facilities, contracts, and market purchases and sales of electrical energy) to reliably serve customers at the lowest cost. We hope that our responses to your questions below are valuable.

While non-utility resources (i.e. generation) may not be prevalent in some parts of the country, in California, they are a significant component of the overall portfolio of generating resources. These resources can and do compete with utility owned generation on an equal footing through competitive solicitations, regular brokered and bilateral trading, and through the CAISO real-time imbalance market, and are dispatched by either the procuring utility or the CAISO on an economic basis subject to system and unit specific constraints. This activity is facilitated by open access tariffs and the operational control of the transmission grid by the CAISO. As such, SCE recommends that any study developed pursuant to the Energy Policy Act of 2005 not include utilities that are participants in organized markets administered by an ISO or RTO.

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Additionally, DOE must recognize the interaction of state commissions in the regulation of utility procurement and dispatch practices. Finally, SCE participated in the Edison Electric Institute's (EEI) process to develop responses to DOE's questions and SCE supports the responses provided by EEI.

SCE respectfully submits the following responses to the DOE's questions. If you have any questions about these responses, please contact:

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1) What are the procedures now used in your region for economic dispatch? Who is performing the dispatch (a utility, an ISO or RTO, or other) and over how large an area (geographic scope, MW load, MW generation resources, number of retail customers within the dispatch area)?

As a member of an ISO (the CAISO) and subject to a state commission (the CPUC), SCE maintains its own unit commitment and economic dispatch process. Via bilateral traded markets and markets operated by the CAISO, SCE participates in additional economic dispatch processes.

CPUC Least Cost Dispatch Process

At present, SCE's portfolio of resources includes utility owned generation, a variety of contractual arrangements for energy and capacity, and resources procured by the State of California and allocated to SCE. The CPUC requires SCE to dispatch these resources in accordance with least cost dispatch.

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In decision D.05-01-054, the CPUC explained that in conducting the daily economic dispatch of energy, utilities must comply with Standard of Conduct No. 4 (SOC 4), which states:

> The utilities shall prudently administer all contracts and generation resources and dispatch the energy in a least-cost manner. Our definitions of prudent contract administration and least cost dispatch are the same as our existing standard.[1]

The Commission elaborated on this standard in decision D.02-12-074, where it placed the following explanation of SOC 4 in the utilities' approved procurement plans:

> Prudent contract administration includes administration of all contracts within the terms and conditions of those contracts, to include dispatching dispatchable contracts when it is most economical to do so. In administering contracts, the utilities have the responsibility to dispose of economic long power and to purchase economic short power in a manner that minimizes ratepayer costs. Least-cost dispatch refers to a situation in which the most cost-effective mix of total resources is used, thereby minimizing the cost of delivering electric services. . . . The utility bears the burden of proving compliance with the standard set forth in its plan.[2]

Additionally, SCE is subject to an annual compliance review with respect to least cost dispatch. In doing so, the CPUC reviews, (1) whether the utility has dispatched the dispatchable contracts under its control "when it is most economical to do so," (2) whether it has "disposed of economic long power and purchased economic short power in a manner that minimizes ratepayer costs," and (3) whether it has used "the most cost-effective mix of its total resources, thereby minimizing the cost of delivering electrical services."

In implementing the least-cost dispatch standard, SCE evaluates all dispatchable resources available to it based on daily market conditions at the time of dispatch. These resources include spot market purchases and sales in the day-ahead, hour-ahead and real-time markets.

SCE's least-cost dispatch process is specifically designed to optimize the use of its existing resources. All resources within its portfolio whose incremental operating costs are below

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1 D.02-10-062, Conclusion of Law 11.

2 D.02-12-074, Ordering Paragraph 24b. The ellipsis indicates language deleted by D.03-06-076, p. 27 and Ordering Paragraph 16.

projected market prices[3] of power over the projected run time are dispatched, provided system reliability considerations allow the resources to operate. Resources whose incremental operating costs are above projected market prices of power over the projected run time are not dispatched, provided the units are not needed for system reliability. Whether units cannot operate or must operate to meet system reliability conditions are determined by CAISO protocols. Market prices (and revenues) may also vary by location (e.g., in import-constrained areas, prices may be somewhat higher, and somewhat lower in export-constrained areas).

CAISO Market Operations

The CAISO operates a limited number of markets including day-ahead and hour-ahead ancillary services and real-time imbalance energy. The ancillary service markets are designed to provide operating reserves to the CAISO and the real-time imbalance energy market is designed as a market to enable the CAISO to balance energy supply and demand after the hour-ahead market. In both cases, the CAISO will dispatch from these markets based upon economic dispatch subject to system constraints. In the Day-Ahead and Hour-Ahead time frame, the CAISO relies on scheduling coordinators to submit a balanced schedule of loads and resources. Thus, scheduling coordinators (of which SCE is one) perform economic dispatch to optimize their own portfolios. These schedules are then subject to redispatch by CAISO due to system limitations or needs (e.g., transmission congestion), changing system conditions (e.g., loss of a generating unit), or economics (e.g., cost savings are achieved by accepting various bids from generators to increase or decrease their output).

Currently the CAISO is in the process of a significant redesign of its market structure. This market redesign includes a day-ahead energy market in which participants can submit

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[3] Market price is defined as the price, available when making a dispatch decision, which one could expect to buy or sell natural gas or electrical energy for delivery during the dispatch period.

supply and demand "bids" that will be cleared by the CAISO based upon a security constrained economic dispatch.[4] It is important to note that in the context of the CAISO markets, least cost determination is based upon "bids" submitted by market participants. These "bids" may or may not reflect the actual cost of the units providing the energy. However, the CAISO's proposed security constrained economic dispatch will minimize the cost to serve load based on submitted supply "bids" subject to transmission constraints.

SCE's service territory is approximately 50,000 square miles and serves a population of more than 13 million via approximately 4.6 million customers. SCE's peak system load is in excess of 20,000 MW[5]. The CAISO controls approximately three quarters of the transmission grid within the state of California. The CAISO peak system load is in excess of 45,000 MW and serves over 200 billion kilowatt hours each year.

2) Is the Act's definition of economic dispatch (see above) appropriate? Over what geographic scale or area should economic dispatch be practiced? Besides cost and reliability, are there any other factors or considerations that should be considered in economic dispatch, and why?

SCE believes that the Energy Policy Act's definition of economic dispatch is accurate providing that all relevant "operational limits of generation and transmission facilities" are appropriately identified including, inter-temporal unit commitment and dispatch decisions[6]. These operational limits are likely to be specific to given areas and may not be readily standardized across the nation as a whole. For example, economic dispatch must recognize the operational characteristics of various generating resources. Generating units such as Hydro facilities are use or energy-limited resources. While the marginal cost of operation in any given

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[4] Least cost dispatch subject to the constraints of the transmission system.

[5] System load includes all customers served from SCE's transmission network. This includes retail (load served by SCE as well as load served by an electricity service provider under retail competition) and wholesale loads.

[6] Inter-temporal unit commitment and dispatch decisions means the choice of an appropriate time horizon (e.g. hourly, daily, monthly, etc.) in which to evaluate the relative costs of alternative resource operation.

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hour may be such that the unit is economical to run, doing so will prohibit the operation of the unit in other hours where the output is more valuable. Therefore, the opportunity cost of such resources must be considered in economic dispatch procedures.

3) How do economic dispatch procedures differ for different classes of generation, including utility-owned versus non-utility generation? Do actual operational practices differ from the formal procedures required under tariff or federal or state rules, or from the economic dispatch definition above? If there is a difference, please indicate what the difference is, how often this occurs, and its impacts upon non- utility generation and upon retail electricity users. If you have specific analyses or studies that document your position, please provide them.

SCE's procedures for least cost dispatch under the CPUC do not differentiate based upon the whether the generator is or is not owned by the SCE. The CAISO's Tariff which governs transmission access to the CAISO grid, ancillary services, congestion managements, scheduling practices, and imbalance market rules also does not differentiate based upon whether or not a utility owns the generation. Within its portfolio, SCE has at its disposal generation owned by SCE, generation under contract to SCE, and generation under contract to the State and allocated to SCE. SCE's least cost dispatch procedures are blind to the distinction between these classes. Relevant considerations are that of incremental operating cost and its relation to market prices, the operational characteristics or contractual limitations of the units, and grid reliability needs. Additionally, the CAISO performs dispatch with cost, transmission reliability, and unit limitations in mind regardless of the ownership of the units.

4) What changes in economic dispatch procedures would lead to more non-utility generator dispatch? If you think that changes are needed to current economic dispatch procedures in your area to better enable economic dispatch participation by nonutility generators, please explain the changes you recommend.

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With respect to SCE's and the CAISO's economic dispatch practices, SCE does not see any changes that are necessary to encourage additional non-utility generator dispatch. As mentioned in our response to questions 1 and 3, SCE and the CAISO areas are comprised of a significant amount of non-utility owned generation. These resources are treated on equal footing with utility owned generation in the least cost dispatch procedures employed by SCE and the CAISO.

5) If economic dispatch causes greater dispatch and use of non-utility generation, what effects might this have – on the grid, on the mix of energy and capacity available to retail customers, to energy prices and costs, to environmental emissions, or other impacts? How would this affect retail customers in particular states or nationwide? If you have specific analyses to support your position, please provide them to us.

SCE and other investor owned utilities in California are already subject to economic dispatch. FERC-jurisdictional transmission access tariffs and CPUC-jurisdictional procurement and least cost dispatch rules should be designed in a manner that permits consumers to gain the benefits of both utility and non-utility generation. A pre-requisite for successful inclusion of non-utility generation is adequate open access tariffs. Each implementation of least-cost dispatch will result in a different mix of resources, prices and costs, and environmental impacts. Any concerns about the results should be addressed on a case-by-case basis rather than as part of a national standard. Additionally, as pointed out in our response to question 2, the state regulators will ultimately provide direction on the retail rates charged by utilities. Therefore, the state regulators must be an integral portion of any efforts to modify the composition or cost of generating resources.

6) *Could there be any implications for grid reliability – positive or negative – from greater use of economic dispatch? If so, how should economic dispatch be modified or enhanced to protect reliability?*

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As defined by the Energy Policy Act, least cost dispatch must recognize, "any operational limits of generation and transmission facilities." As such, any economic dispatch must not only include cost as part of its basis for decision but it must also include impacts to the system on which the energy is transmitted and delivered. In California, this is accomplished by the CAISO, which is tasked with responsibility for system reliability.